

IN THE CLAIMS

This listing of the claims will replace all prior versions, and listings of claims in the application.

Listings of Claims:

1. (Withdrawn) A method of producing a semiconductor device for forming gate electrodes of a plurality of transistors supplied with different voltages on a semiconductor substrate via a gate insulating film, comprising the steps of:
forming said gate insulating film on said semiconductor substrate;
forming a gate electrode layer containing an impurity on said gate insulating film;
implanting an impurity at regions of said gate electrode layer for forming transistors where the electrical effective thickness required of said gate insulating film based on said voltage is relatively thin; and
processing said gate electrode layer to form gate electrodes with concentrations of impurities differing for each transistor.
2. (Withdrawn) A method of producing a semiconductor device as set forth in claim 1, wherein the step of forming said gate electrode layer comprises the steps of:
forming an amorphous silicon layer on said gate insulating film and
implanting an impurity in said amorphous silicon layer.
3. (Withdrawn) A method of producing a semiconductor device as set forth in claim 1, wherein the step of forming said gate insulating film comprises forming on said semiconductor substrate said gate insulating film with different thicknesses between regions for forming transistors having relatively thin effective thicknesses of said gate insulating film and regions for forming transistors having relatively thick effective thicknesses of said gate insulating film.
4. (Withdrawn) A method of producing a semiconductor device for forming gate electrodes of transistors and upper electrodes of capacitors via insulating films on a semiconductor substrate, comprising the steps of:

forming lower electrodes of said capacitors in said semiconductor substrate;
forming an insulating film for forming gate insulating films of said transistors and capacitive insulating films of said capacitors on said semiconductor substrate and said lower electrodes;
forming an electrode layer containing an impurity for forming said gate electrodes and said upper electrodes on said insulating film;
implanting an impurity at regions of said electrode layer for forming transistors where the effective thickness required of said insulating film is relatively thin compared with said capacitors; and
processing said electrode layer to form said gate electrodes and said upper electrodes having different concentrations of impurities.

5. (Withdrawn) A method of producing a semiconductor device as set forth in claim 4, wherein the step of forming said lower electrodes comprises the steps of:

forming a sacrificial film on said semiconductor substrate;
implanting the impurity via said sacrificial film in regions of said semiconductor substrate for forming said capacitors so as to form said lower electrodes; and
removing said sacrificial film.

6. (Withdrawn) A method of producing a semiconductor device as set forth in claim 4, wherein the step of forming said electrode layer comprises the steps of:

forming an amorphous silicon layer on said insulating film and
implanting an impurity in said amorphous silicon layer.

7. (Withdrawn) A method of producing a semiconductor device as set forth in claim 4, wherein the step of forming said insulating film comprises forming said insulating film with

different thicknesses between regions for forming the gate insulating films of said transistors and regions for forming capacitive insulating films of said capacitors.

8. (Currently Amended) A semiconductor device comprising:
a semiconductor substrate; and
a plurality of electronic circuit elements formed at parts of the semiconductor substrate for each electrically independent region and including insulating films and electrodes formed on the insulating films,

wherein:

the insulating films differing in required electrical effective thickness for each electronic circuit element, and

the electrodes having different concentrations of impurities for each circuit element with the same conductivity type according to the effective thickness.

9. (Original) A semiconductor device as set forth in claim 8, wherein said electrodes of said electronic circuit elements with thick required effective thicknesses have relatively low concentrations of the impurities and said electrodes of said electronic circuit elements with thin required effective thicknesses have relatively high concentrations of the impurities.

10. (Original) A semiconductor device as set forth in claim 8, wherein said electronic circuit elements include a plurality of transistors having said electrodes as gate electrodes and said insulating films as gate insulating films.

11. (Original) A semiconductor device as set forth in claim 8, wherein said electronic circuit elements include transistors having said electrodes as gate electrodes and said insulating films as gate insulating films and capacitors having said electrodes as capacitive electrodes and said insulating films as said capacitive insulating films.

12. (Original) A semiconductor device as set forth in claim 8, wherein said insulating films are formed to substantially the same thicknesses.

13. (Original) A semiconductor device as set forth in claim 8, wherein said insulating films are formed to different thicknesses.